

Claims

1. A method of obtaining a measurement plane from a multi-section tunable laser diode is provided, the method comprising the steps of:
obtaining a first set of measurement values for the output of the laser diode by increasing a first current/voltage through a range of values in a positive direction;
increasing a second control current/voltage by a step;
obtaining a second set of measurement values for the output of the laser diode by decreasing the first control current/voltage through a range of values in a negative direction;
increasing a second control current/voltage by a step;
repeating the above steps until a sufficient range of the second control current/voltage has been used;
and
identifying in the resultant data set regions of hysteresis.
2. The method as claimed in claim 1 wherein the identification of regions of hysteresis is effected by:
applying to the resultant data a laplacian or similar operator; and
thresholding the resultant data to obtain the hysteresis regions, the hysteresis regions being those regions where the value at a specified current is above the threshold value.

3. The method of claim 1 wherein the first and second set of measurement values are obtained by transmitting the output of the laser diode to a photo diode, whereby an output of the photo diode provides the first and second measurement values.
4. The method of claim 1 wherein the first and second set of measurement values are obtained by transmitting the output of the laser to a photo diode via an optical filter, whereby an output of the photo diode provides the measurement values.
5. The method of claim 1 wherein the first and second set of measured values are obtained by measuring the voltage on a section of the laser where current used to control the laser output.
6. The method of claim 1 wherein the first and second set of measured values are obtained by measuring the current on a section of the laser where voltage used to control the laser output.
7. The method of claim 1 wherein the first and second set of measurement values are obtained by transmitting the output of the laser to a system or instrument that can measure either linewidth or SMSR or the laser.
8. The method as claimed in claim 1 wherein the regions of hysteresis are determined by using an erosion operator to obtain the hysteresis regions of the laser diode.

9. The method as claimed in any preceding claim wherein the value of the increment of the first and second control currents is such that there are no large changes in any single control current between measurements thereby minimising the temperature effect contribution to the output of the laser.
10. A method as claimed in claim 1 where the range of values measured for the first current/voltage and/or the second current/voltage is non-linear.
11. A method of obtaining a measurement plane from a multi-section tunable laser is provided, the method comprising the steps of:
obtaining a first set of measurement values for the output of the laser diode by increasing a first control current through a range of values in a positive direction and decreasing a second control current in a negative direction at the same time;
increasing one of the first or second control current by a step;
obtaining a second set of measurement values for the output of the laser diode by increasing the second control current through a range of values in a positive direction and decreasing a first control current in a negative direction at the same time;
and
repeating the above steps until a sufficient range of the first and the second control current has been used, where the total control currents to the laser are changing at a continuous rate.

12. A method as claimed in claim 11 where the non-linear range of current used related to a characteristic of the laser such as wavelength tuning.

13. A computer program comprising program instructions for causing a computer to perform the method of any one of claims 1 to 12.

14. A computer program as claimed in claim 13 embodied on a record medium.

15. A computer program as claimed in claim 13 embodied on a carrier signal.

16. A computer program as claimed in claim 13 embodied on a read-only memory.

17. A control system for obtaining a measurement plane from a multi-section tunable laser diode, the system comprising:

means for obtaining a first set of measurement values for the output of the laser diode by increasing a first current through a range of values in a positive direction;

means for increasing a second control current by a step;

means for obtaining a second set of measurement values for the output of the laser diode by decreasing the first control current through a range of values in a negative direction;

means for increasing a second control current by a step;

means for repeating the above steps until a sufficient range of the second control current has been used; and

means for identifying in the resultant data set regions of hysteresis.

18. The control system as claimed in claim 17 wherein the means for identifying regions of hysteresis comprises:

means for applying to the resultant data a laplacian or similar operator; and

means for thresholding the resultant data to obtain the hysteresis regions, the hysteresis regions being those regions where the value at a specified current is above the threshold value.

19. The control system as claimed in claim 17 wherein the first and second set of measurement values are obtained by transmitting the output of the laser diode to a photo diode, whereby an output of the photo diode provides the first and second measurement values.

20. The control system as claimed in claim 17 wherein the first and second set of measurement values are obtained by transmitting the output of the laser to a photo diode via an optical filter, whereby an output of the photo diode provides the measurement values.

21. The control system as claimed in claim 17 wherein the regions of hysteresis are determined by using an erosion operator to obtain the hysteresis regions of the laser diode.

22. The control system as claimed in any of claims 17 to 21 wherein the value of the increment of the first and second control currents is such that there are no large changes in any single control current between measurements thereby minimising the temperature effect contribution to the output of the laser.

23. A control system for obtaining a measurement plane from a multi-section tunable laser is provided, the system comprising:

means for obtaining a first set of measurement values for the output of the laser diode by increasing a first control current through a range of values in a positive direction and decreasing a second control current in a negative direction at the same time;

means for increasing one of the first or second control current by a step;

means for obtaining a second set of measurement values for the output of the laser diode by increasing the second control current through a range of values in a positive direction and decreasing a first control current in a negative direction at the same time; and

means for repeating the above steps until a sufficient range of the first and the second control current has been used, where the total control currents to the laser are changing at a continuous rate.